

# Continuous Authentication Using Behavioral Biometrics

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## ABSTRACT

Currently, the standard methods to authenticate a computer/network user typically occur once at the initial log-in. These authentication methods involve user proxies, especially passwords and smart cards such as common access cards (CACs) and service ID cards. Passwords suffer from a variety of vulnerabilities including brute-force and dictionary based attacks, while smart cards and other physical tokens used for authentication can be lost or stolen. As a result, the computer systems are extremely vulnerable to “masquerading attacks”, which refers to illegitimate activity on a computer system when an unauthorized human or software impersonates a user on a computer system or network. These attacks can be challenging to detect as they are mostly carried out by insiders or people or software familiar with the authorized user. By actively and continually authenticating a user, intruders can be identified before they hijack the user session of an authorized individual who may have momentarily stepped away from his/her console. In this talk, we will present our results on continuous authentication using keystroke dynamics as the behavioral biometric. The methods we developed can also be readily extended to protecting wired and wireless networks, mobile devices, etc.

## Author Keywords

Behavioral biometric; continuous authentication; keystroke dynamics; machine learning

**BIOGRAPHY:** Prof. Shambhu J. Upadhyaya is with the Computer Science and Engineering department at the State University of New York at Buffalo where he directs the Center of Excellence in Information Systems Assurance Research and Education (CEISARE), designated by the National Security Agency (NSA) and the Department of Homeland Security (DHS). His research interests are

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Prof. Upadhyaya has held visiting research faculty positions at the Center for Reliable and High Performance Computing, University of Illinois at Urbana-Champaign, Intel Corporation, U.S. Air Force Research Laboratory and the U.S. Naval Research Laboratory. He has been awarded an IBM Faculty Partner Fellowship for year 2000-01 in recognition of his research accomplishments. He was also a National Research Council faculty fellow in 2001 and 2002. He received the Best Poster Award in the 8<sup>th</sup> IEEE BTAS Conference, 2016 for his work on “Adaptive Techniques for Intra-User Variability in Keystroke Dynamics.”

Prof. Upadhyaya has served as the Program Chair and General Chair of several IEEE conferences in areas ranging from security and privacy, distributed systems, and VLSI testing. He was an associate editor of IEEE Transactions on Computers from 2001 to 2006, and is a member of the editorial board of the International Journal on Reliability, Quality, and Safety Engineering published by the World Scientific Publishers, and the Transactions on Security and Safety published by the Institute of Computer Sciences, Social Informatics and Telecommunications (ICST).